



Air Gap Transducers

AGT-3G - 3rd generation

The AGT-3G is a capacitive air gap monitoring system combining state-of-the-art digital signal processing, a robust sensor design resistant to strong magnetic fields, galvanically isolated inputs and outputs, and a modular architecture for dynamic rotor-stator gap measurement.

KEY FEATURES

- Multiple measuring ranges for application flexibility
- Embedded digital signal processing
- 4–20 mA / 2–10 V outputs, galvanically isolated
- Noise filtering algorithms for improved signal repeatability
- Temperature range: –40 to +155 °C (sensor)
- Immunity to magnetic fields
- Modular design: sensor, oscillator, and demodulator



MONITORING SOLUTIONS



Air gap

TYPICAL APPLICATIONS



Hydrogenerators



Windturbines



Gearless millsdrives



DESCRIPTION

The dynamic air gap monitoring of generators consists of measuring the distance between rotor poles and stator while it is in operation.

The MCm AGT range of air gap sensors are a non-contact dynamic position transducer utilising a capacitive technique to provide an accurate displacement measurement from the sensor face to a metal target. The advantage of the capacitive technique in generator applications is the high immunity to magnetic fields; the AGT series also provides high resolution and relative insensitivity to different (metal)

target materials.

Typical contact-free capacitive Air Gap Transducer (AGT) is composed of 3 elements. It features separate Sensor (AGS), the Air Gap Oscillator (AGO) and the Demodulator (AGD).

SENSOR

Designed for long life cycles, harsh environments and strong magnetic fields. The sensor shape is suitable for its installation on the stator wall of generators and motors. A dedicated epoxy adhesive kit is available as an accessory for proper installation in the machine.

OSCILLATOR

With two executions available - standard and rugged - the oscillator is responsible for conversion of the distance detected by the sensor to an electrical information.

DEMODULATOR

The demodulator provides three signal outputs :

- MinGap¹ voltage (V)
- Pole Profile voltage (V)
- Pole Profile or MinGap¹ current (mA)

All outputs are galvanically isolated and the current output is factory set on Pole Profile. The digital technology combined with high performance noise rejection filters allow a linearization adjusted with great accuracy and resolution, with stable and repetitive behaviours. Industrial metal housing enables installation in harsh environments.

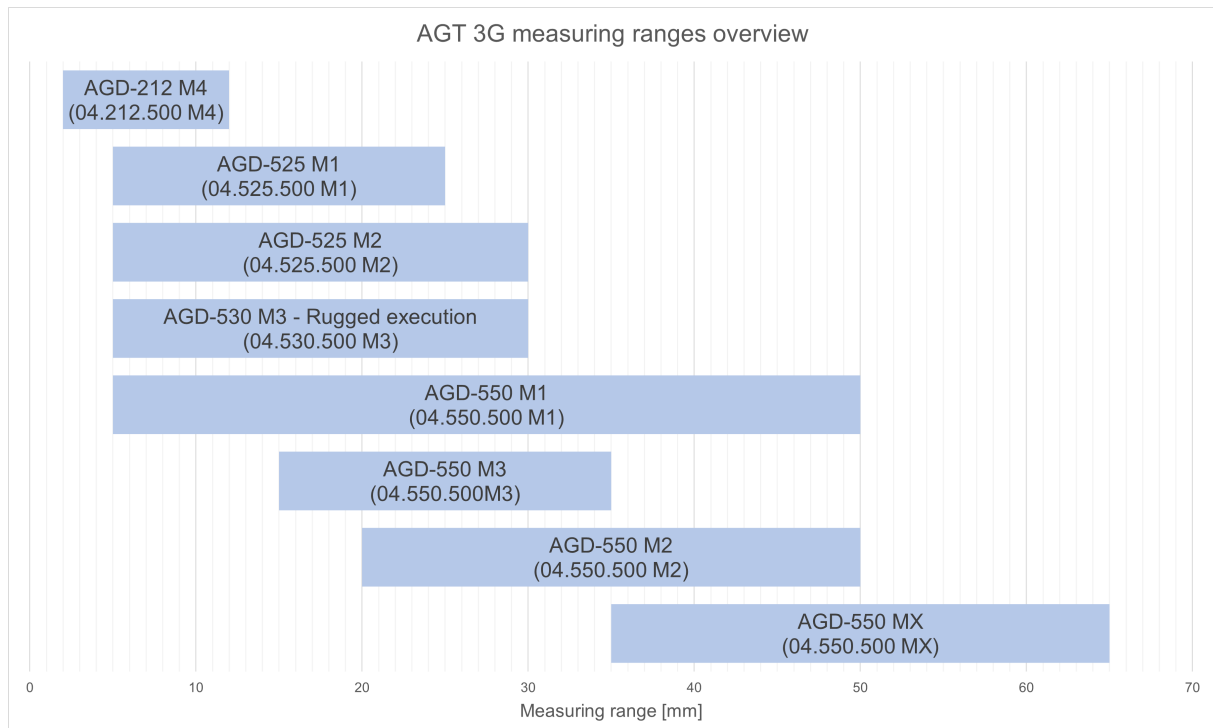
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AVAILABLE EXECUTION

The AGT system is primarily available in Standard execution, designed for typical industrial environments and suitable for most applications. It features a miniature coaxial connector with locking screw, an industry-grade plastic AGO housing, and a PVC signal cable rated for temperatures up to 90 °C (from AGO to AGD), providing an optimal balance between robustness and flexibility.

For specific measuring ranges and demanding environments, a Rugged execution is also available. This version was developed to ensure reliable operation under severe mechanical, thermal, or environmental conditions such as those encountered in mining installations. It incorporates a triaxial push-pull connector, a stainless-steel AGO housing, and a reinforced ETFE cable rated for 150 °C (from AGO to AGD), ensuring superior protection and reliability in harsh environments. Depending on the installation distance between the AGO and the AGD, the rugged version also allows users to shorten the cable length on site by cutting the excess and stripping the conductors before connection to the AGD, offering additional flexibility during installation.

MEASURING RANGES OVERVIEW



¹See user manual for detailed description.

AGT-212 3G SPECIFICATIONS

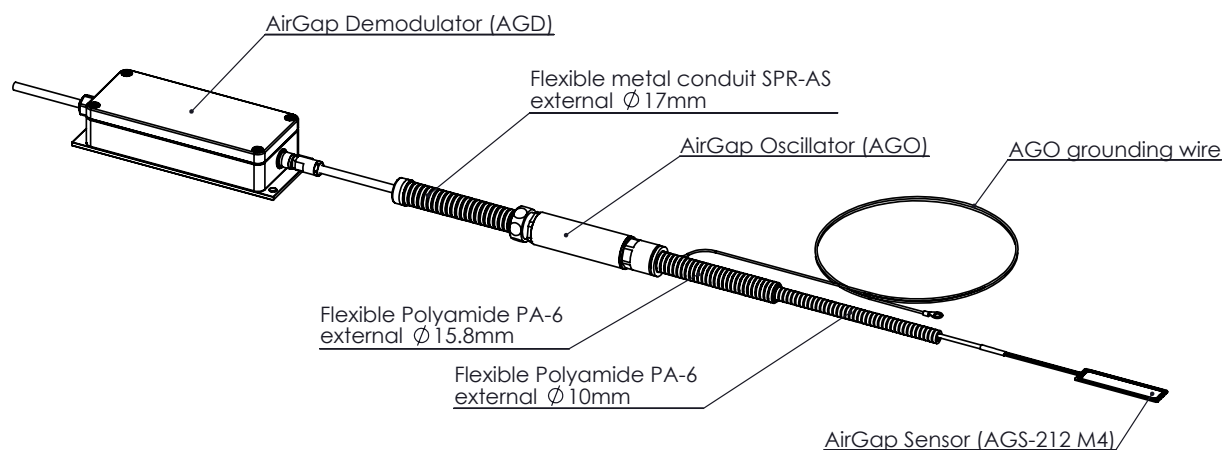
AGD-212 M4

Linear measuring range	2 to 12 mm (0.079 to 0.47 in)
Voltage output sensitivity	0.8 V/mm
Current output sensitivity	1.6 mA/mm
Max. deviation from straight line	< 3.5% of reading
Average linearity error	< 0.5%

AGS-212 M4

Dimensions	70 mm × 17.5 mm × 0.9 mm (L × W × H) with 80 mm of flex part
Interface	MCX coaxial plug
Cable type	PTFE triaxial cable, outer diameter 3.2 mm (max.)
Cable length	1.3 m (min.)
Net weight	approx. 35 g

TRANSDUCER OVERVIEW



AGT-525 3G SPECIFICATIONS

AGD-525 M1

Linear measuring range	5 to 25 mm (0.2 to 0.9 in)
Voltage output sensitivity	0.4 V/mm
Current output sensitivity	0.8 mA/mm
Max. deviation from straight line	< 4.5% of reading
Average linearity error	< 1.0%

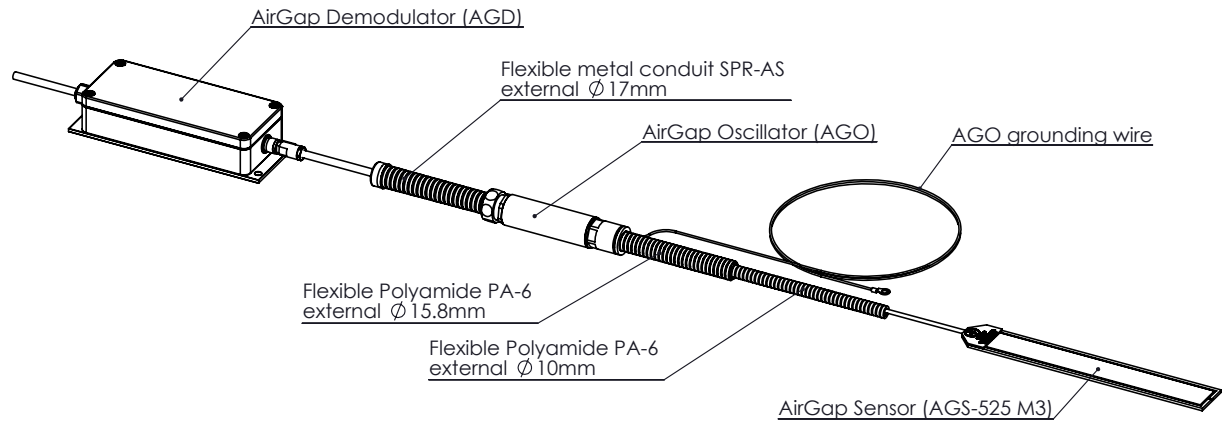
AGD-525 M2

Linear measuring range	5 to 30 mm (0.2 to 1.18 in)
Voltage output sensitivity	0.32 V/mm
Current output sensitivity	0.64 mA/mm
Max. deviation from straight line	< 5.0% of reading
Average linearity error	< 0.5%

AGS-525 M3

Dimensions	221 mm × 32 mm × 3.5 mm (L × W × H)
Interface	MCX coaxial plug
Cable type	PTFE triaxial cable, outer diameter 3.2 mm (max.)
Cable length	1.7 m (min.)
Net weight	approx. 70 g

TRANSDUCER OVERVIEW



AGT-530 3G SPECIFICATIONS - RUGGED EXECUTION

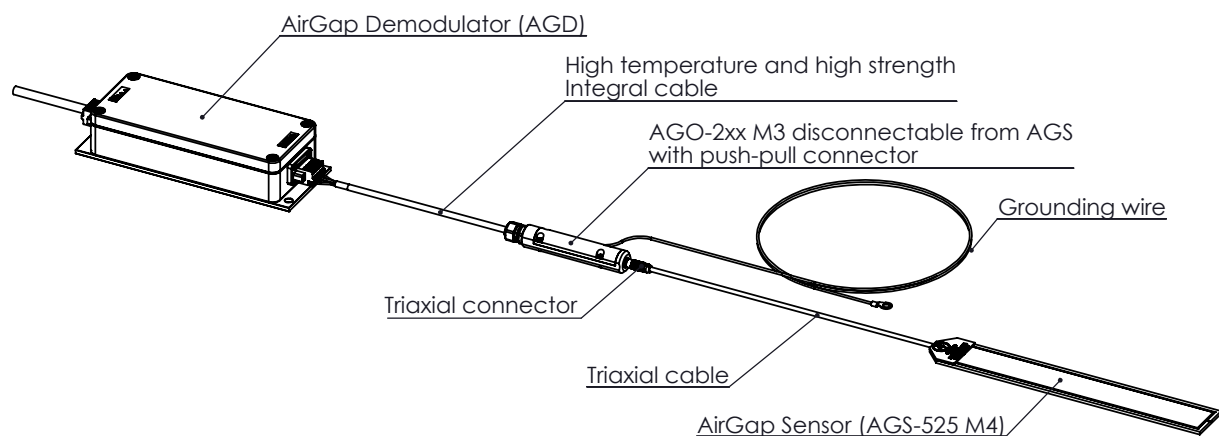
AGD-530 M3

Linear measuring range	5 to 30 mm (0.2 to 1.18 in)
Voltage output sensitivity	0.32 V/mm
Current output sensitivity	0.64 mA/mm
Max. deviation from straight line	< 3.5% of reading from 11mm to 29mm < 5.0% of reading from 5mm to 30mm
Average linearity error	< 0.8%

AGS-525 M4

Dimensions	221 mm × 32 mm × 3.5 mm (L × W × H)
Interface	LEMO triaxial plug
Cable type	PTFE triaxial cable, outer diameter 3.2 mm (max.)
Cable length	1.7 m (min.)
Net weight	approx. 50 g

TRANSDUCER OVERVIEW



AGT-550 3G SPECIFICATIONS

AGD-550 M1

Linear measuring range	5 to 50 mm (0.2 to 1.96 in)
Voltage output sensitivity	0.178 V/mm
Current output sensitivity	0.355 mA/mm
Max. deviation from straight line	< 4.2% of reading from 16mm to 46mm < 6.3% of reading from 5mm to 50mm
Average linearity error	< 0.5%

AGD-550 M2

Linear measuring range	20 to 50 mm (0.79 to 1.96 in)
Voltage output sensitivity	0.267 V/mm
Current output sensitivity	0.533 mA/mm
Max. deviation from straight line	< 2.8% of reading
Average linearity error	< 0.6%

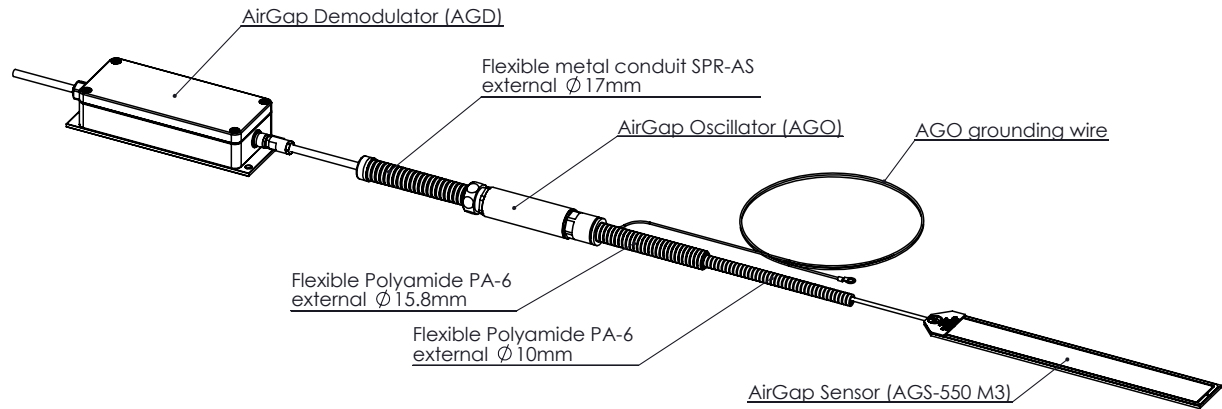
AGD-550 M3

Linear measuring range	15 to 35 mm (0.59 to 1.38 in)
Voltage output sensitivity	0.4 V/mm
Current output sensitivity	0.8 mA/mm
Max. deviation from straight line	< 2.5% of reading
Average linearity error	< 0.3%

AGS-550 M3

Dimensions	263.5 mm × 38 mm × 3.5 mm (L × W × H)
Interface	MCX coaxial plug
Cable type	PTFE triaxial cable, outer diameter 3.2 mm (max.)
Cable length	1.9 m (min.)
Net weight	approx. 90 g

TRANSDUCER OVERVIEW



AGT-550MX 3G SPECIFICATIONS

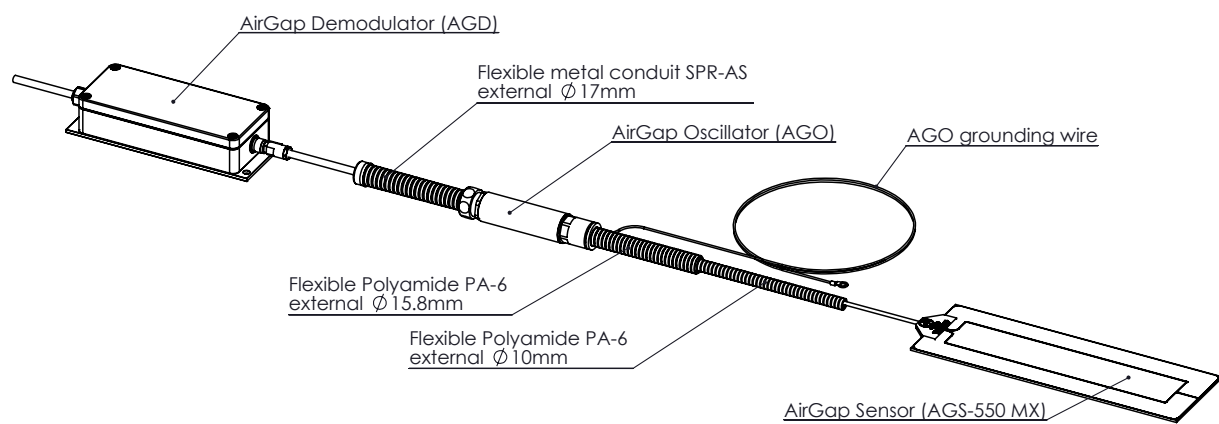
AGD-550 MX

Linear measuring range	35 to 65 mm (1.38 to 2.56 in)
Voltage output sensitivity	0.267 V/mm
Current output sensitivity	0.533 mA/mm
Max. deviation from straight line	< 2.1% of reading
Average linearity error	< 0.2%

AGS-550 MX

Dimensions	263 mm × 80 mm × 3.5 mm (L × W × H)
Interface	MCX coaxial plug
Cable type	PTFE triaxial cable, outer diameter 3.2 mm (max.)
Cable length	1.8 m (min.)
Net weight	approx. 135 g

TRANSDUCER OVERVIEW



GLOBAL SPECIFICATIONS

OPERATION

Output function	Voltage PP ¹	Current – PP or MG ¹	Voltage MG ¹
Output range	2 to 10 V	4 to 20 mA	2 to 10 V
Loop resistance (current output)	n/a	Max. 500 Ω	n/a
Output resistance (voltage outputs)	100 $\Omega \pm 1\%$	n/a	100 $\Omega \pm 1\%$
AGD temperature coefficient	< 200 ppm/°C		
AGO+AGS temperature deviation max.	< 5% of reading at mid-scale from 0°C to 85°C		
Typical frequency response (–3dB)	DC to 1 kHz		
Output noise	< 50 mVrms		
System repeatability	99.9% in constant conditions		
Interchangeability tolerance ²	< 5% of full scale for all types excepted below: < 12% of full scale for types AGT-550		
Power			
• Voltage	+24 VDC nominal $\pm 10\%$ / Warm-up time 10 minutes		
• Current consumption	125 mA typical		

ENVIRONMENTAL

	Sensor	Demodulator	Oscillator
Operation Temperature range	-40° to +155°C (200°C short term survival)	-40° to +85°C	-40° to +85°C
Ingress protection (acc. to EN60529)	n/a	IP66	IP50 (Standard execution) IP64 (Rugged execution)

¹PP stands for Pole Profile, MG stands for Min Gap, for detailed information please refer to the user manual.

²Systems may be paired on request; in that case the interchangeability tolerance drops to 0.

Long term storage (all models)	10 to 40°C / 10 to 50% RH non-condensing
Relative humidity (non-condensing)	0 to 95%
Intended use	Indoor / outdoor
Shock	IEC 60068-2-27 standard, 15g peak, 11ms
Vibration	IEC 60068-2-6 standard 5g peak, 10Hz...150Hz
EMC	EN 61326-2-3 / Sensor withstands 1.5 Tesla in a 50 or 60Hz magnetic field
Fluid compatibility	withstands contact with water, oil, solvents, acids without degradation of material.

CERTIFICATIONS

CE certified	All AGT systems comply with applicable European directives.
UL certification	Available on request for all Standard executions to meet North American safety requirements.

TERMINOLOGY

Max deviation from straight line	Is the largest relative error calculated between the actual output level at any distance (voltage or current) and the theoretical output level for the same distance. This error does not include the interchangeability tolerance of the AGT parts.
Average linearity error	Is the relative error between the theoretical output sensitivity and the actual average sensitivity.

MECHANICAL SPECIFICATIONS

AGO-XXX M3

Dimensions	120 mm (L) × ø25 mm
Net weight	approx. 60 g + 25 g per meter of cable
Locking screw tightening torque	0.1Nm max.

AGO-2XX M3

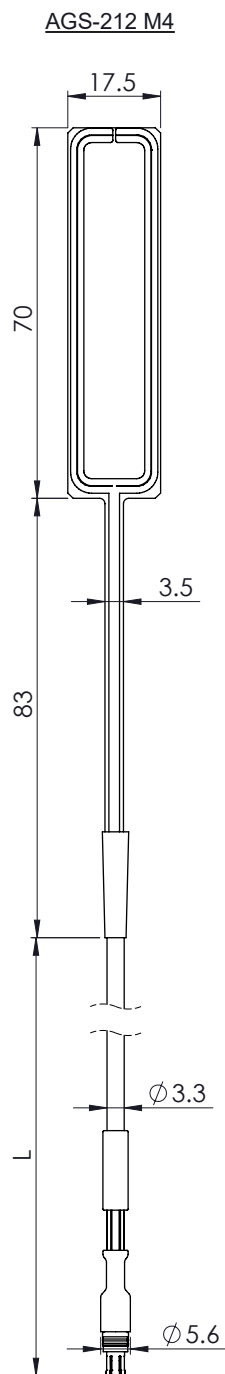
Dimensions	100 mm (L) × ø16 mm
Net weight	approx. 250 g + 40 g per meter of cable

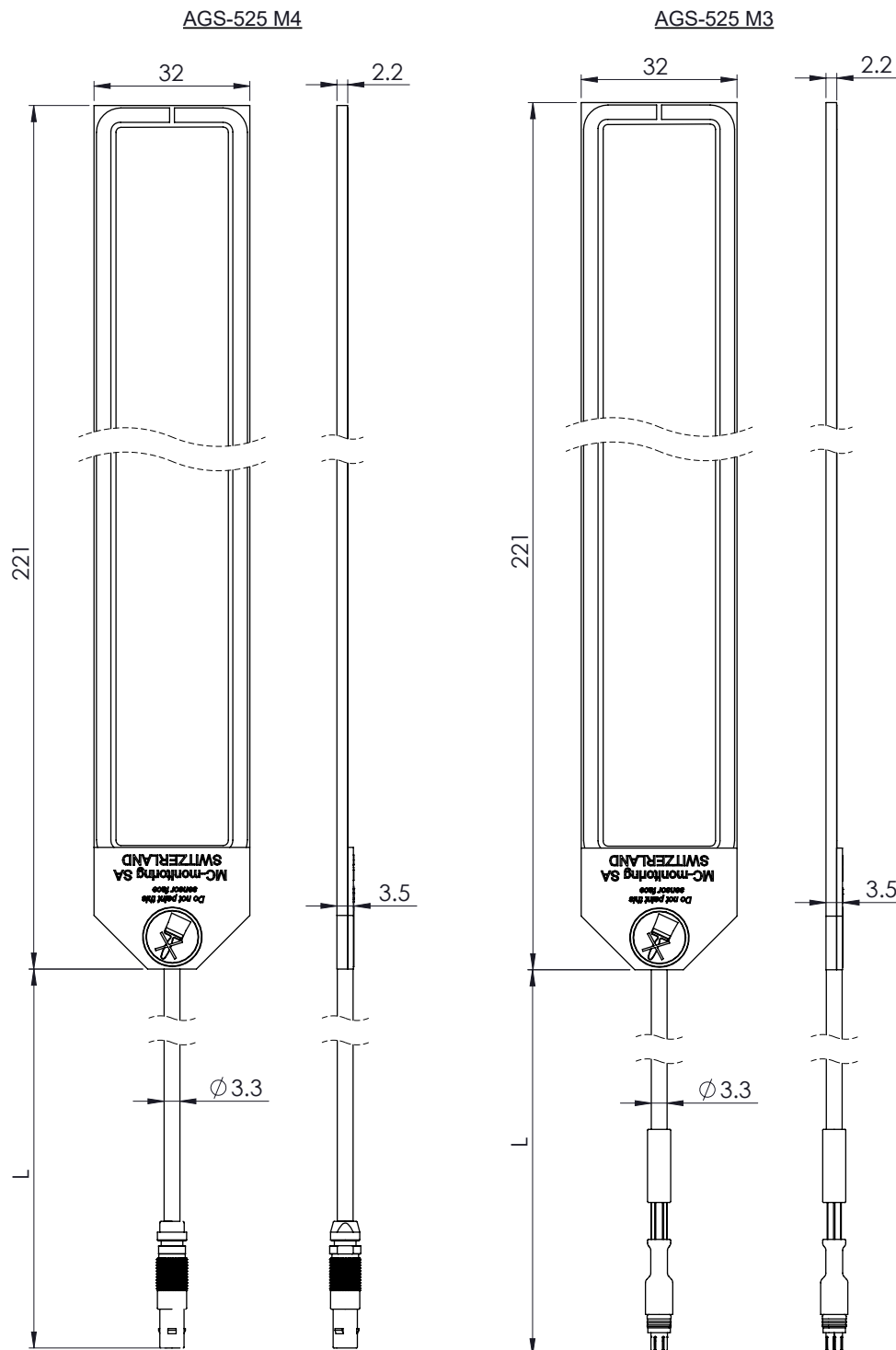
AGD

Dimensions	170 mm × 63 mm × 40 mm (L × W × H)
Net weight	approx. 513 g

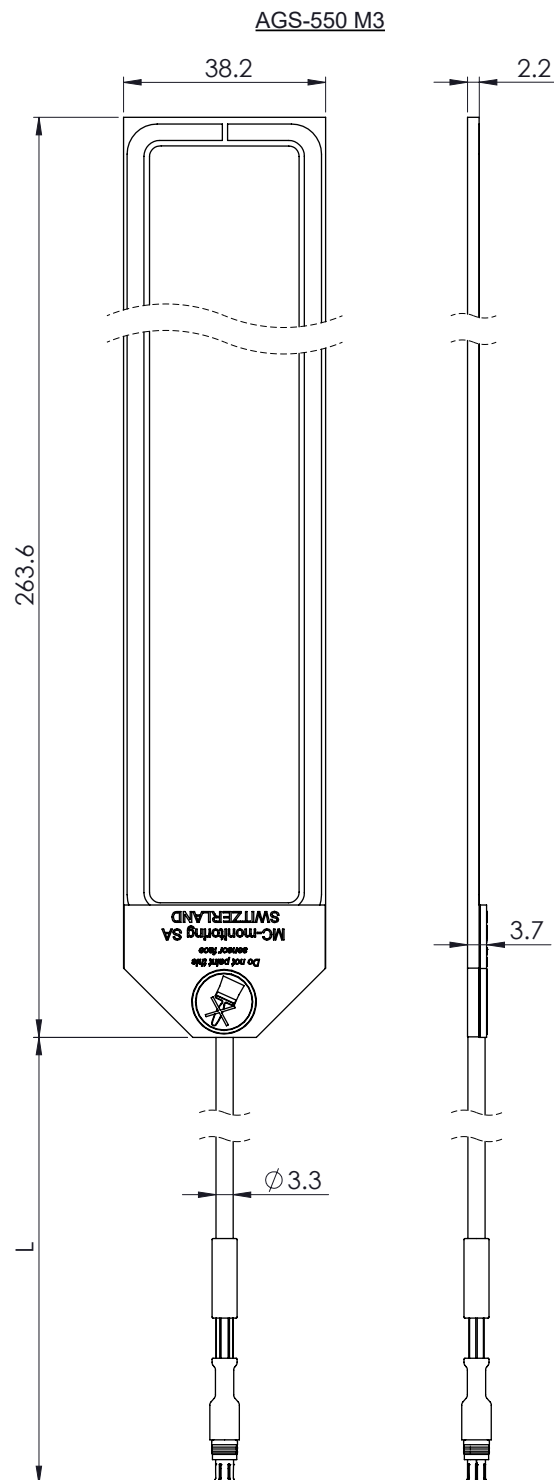
MECHANICAL DRAWINGS

AGS-212

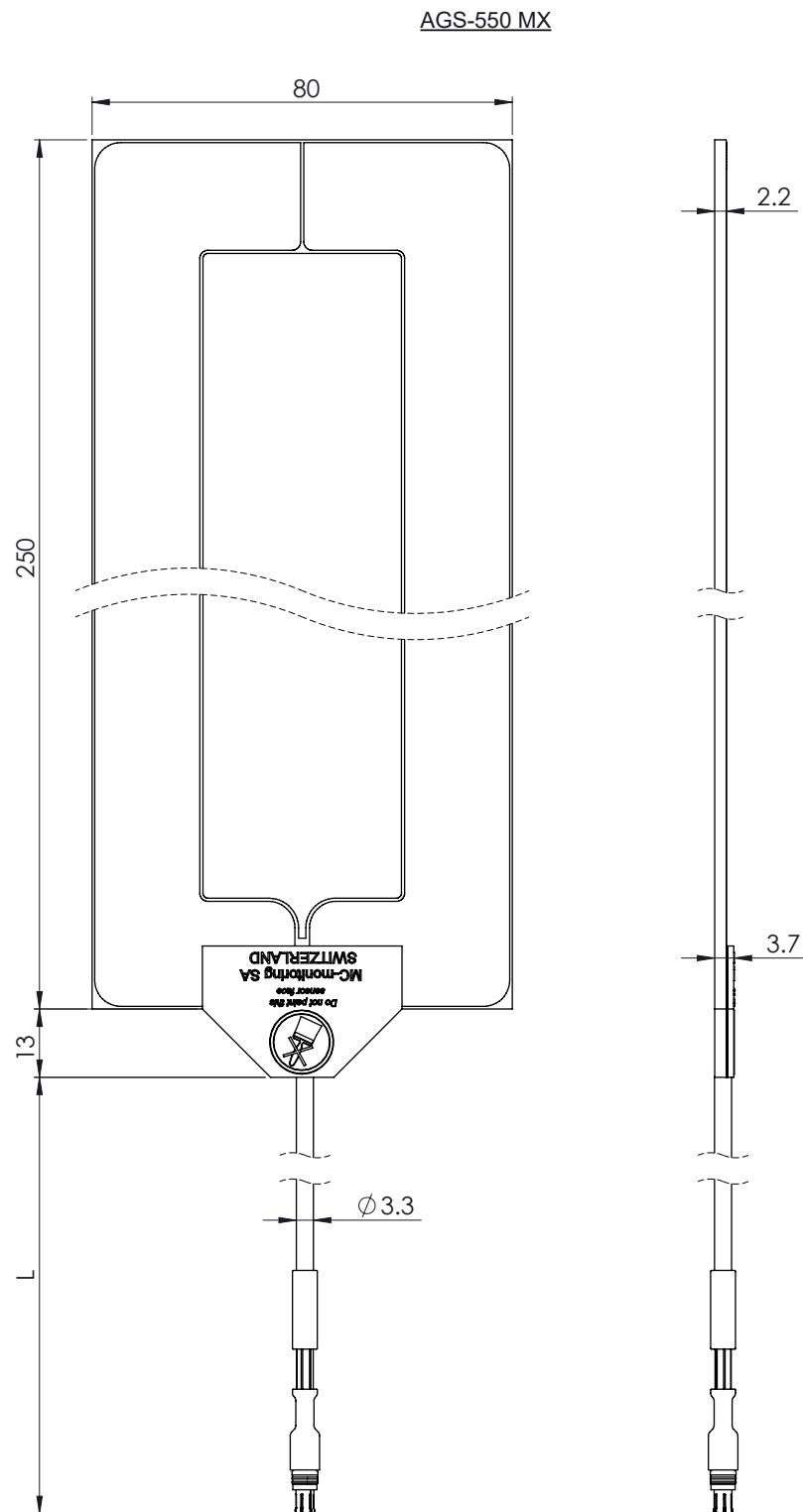


AGS-525

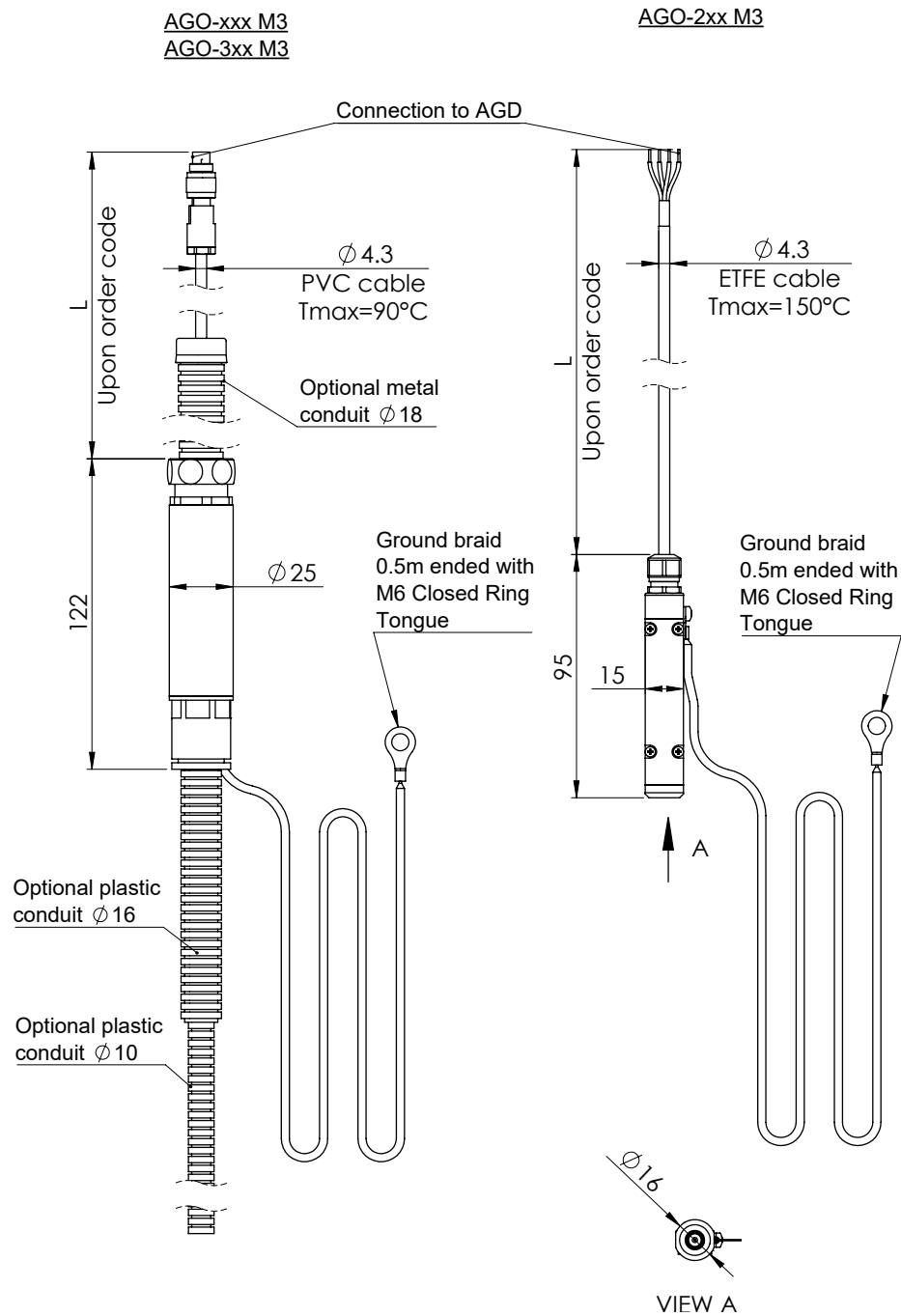
AGS-550M3

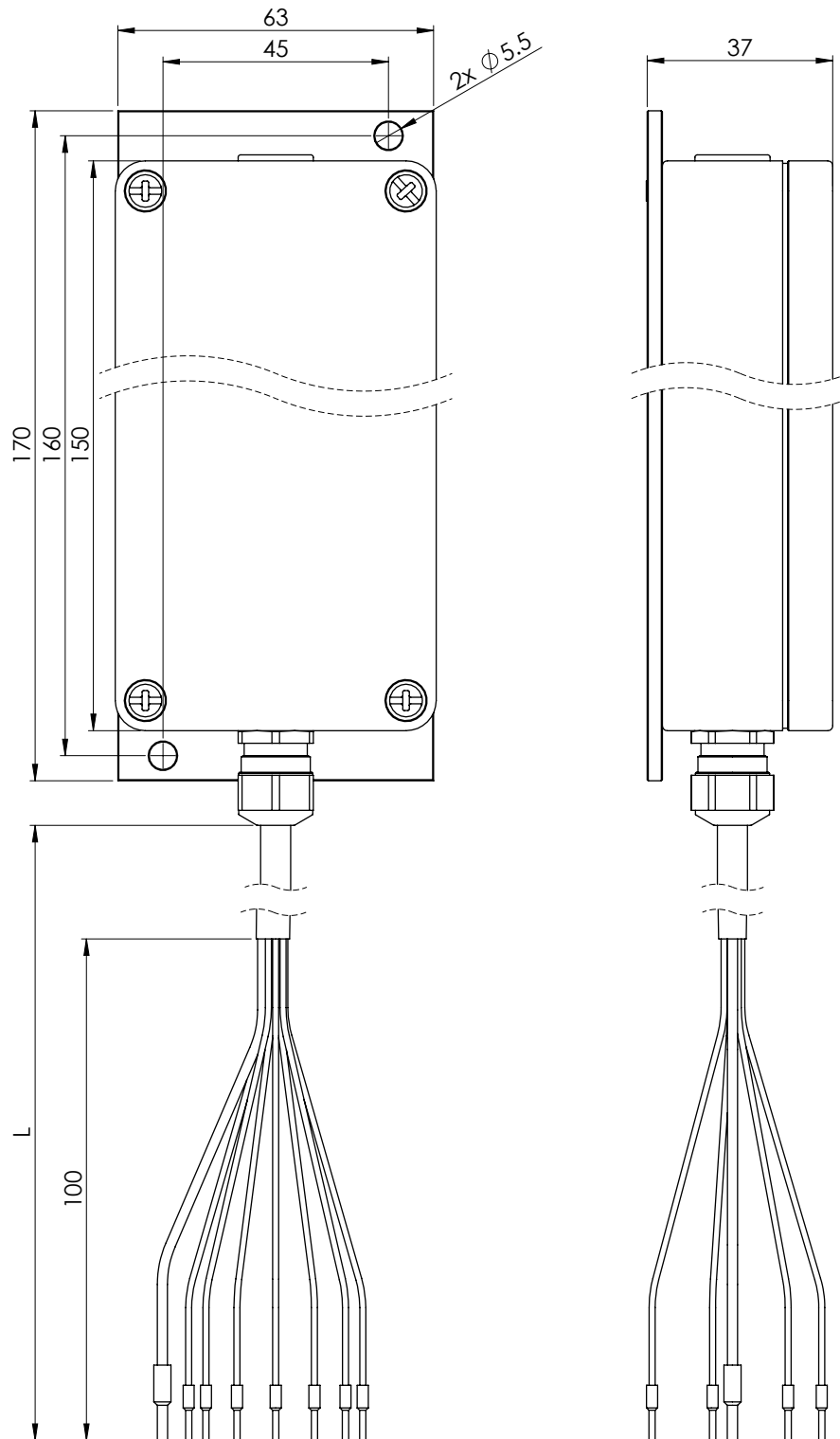


AGS-550MX

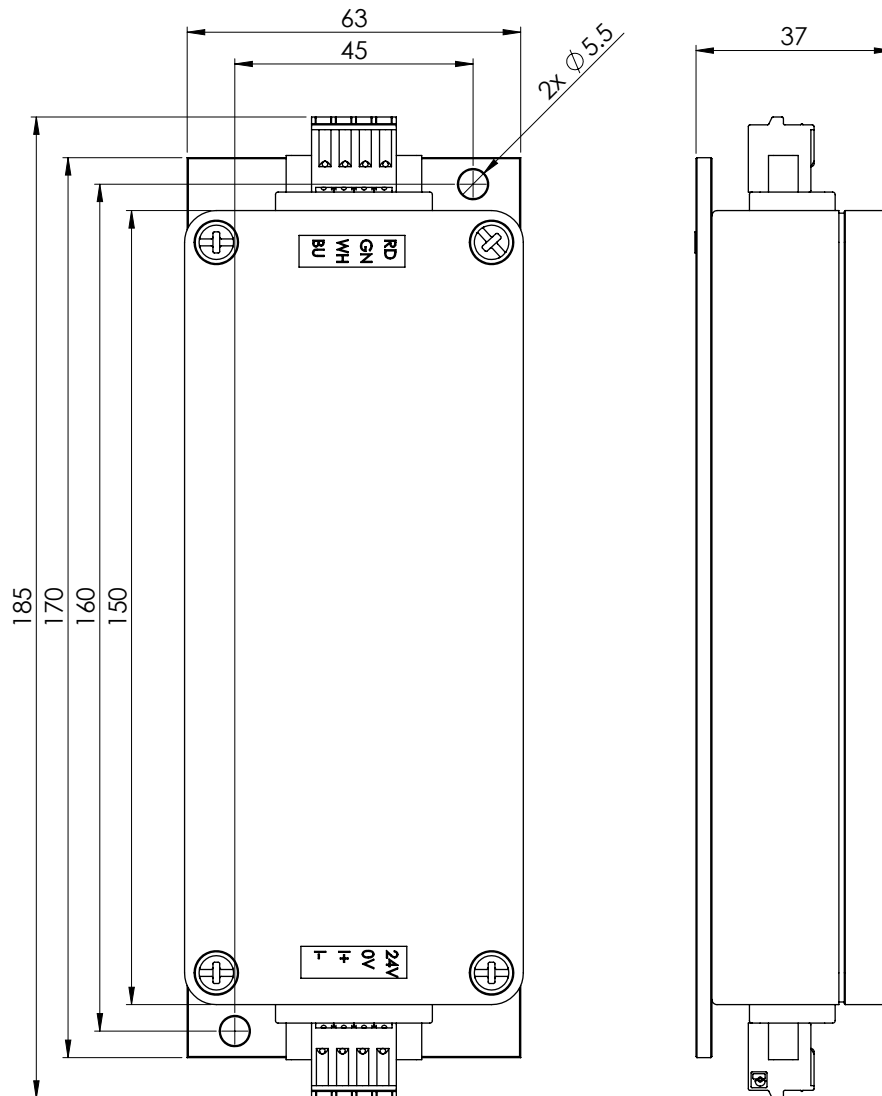


AGO



AGD (STANDARD)

AGD (RUGGED)



ORDERING INFORMATION

When AGT system components are ordered separately, the Flexible Polyamide PA-6 conduit (providing protection for the triaxial cable from the AGS to the AGO) and the Flexible Metallic Conduit SPR-AS (providing protection for the cable from the AGO to the AGD) are not included by default. These protective conduits must be ordered separately; please refer to the Accessories section for further details.

When ordering a standardized AGT system, both protective conduits are included as standard.

LIST OF PARTS NUMBERS

Type (3G)	AGS (p/n)	AGO (p/n)	AGD (p/n)	Measuring range [mm]		Output range
				<i>min</i>	<i>max</i>	
AGT-212	AGS-212 M4 (04.212.100 M4)	AGO-xxx M3 (04.xxx.400 M3)	AGD-212 M4 (04.212.500 M4)	2	12	4-20mA / 2-10V
AGT-525	AGS-525 M3 (04.525.100 M3)		AGD-525 M1 (04.525.500 M1)	5	25	4-20mA / 2-10V
AGT-525	AGS-525 M3 (04.525.100 M3)		AGD-525 M2 (04.525.500 M2)	5	30	4-20mA / 2-10V
AGT-550	AGS-550 M3 (04.550.100 M3)		AGD-550 M1 (04.550.500 M1)	5	50	4-20mA / 2-10V
AGT-550	AGS-550 M3 (04.550.100 M3)		AGD-550 M2 (04.550.500 M2)	20	50	4-20mA / 2-10V
AGT-550	AGS-550 M3 (04.550.100 M3)		AGD-550 M3 (04.550.500 M3)	15	35	4-20mA / 2-10V
AGT-550MX	AGS-550 MX (04.550.100 MX)		AGD-550 MX (04.550.500 MX)	35	65	4-20mA / 2-10V
AGT-530 Rugged	AGS-525 M4 (04.525.100 M4)	AGO-2xx M3 (04.2xx.400 M3)	AGD-530 M3 (04.530.500 M3)	5	30	4-20mA

Notes:

AGO-xxx M3 standard lengths: 8m (AGO-080 M3), 10m (AGO-100 M3), 15m (AGO-150 M3), other length on request

AGO-2xx M3 standard lengths: 8m (AGO-208 M3), 10m (AGO-210 M3), 22m (AGO-222 M3), 28m (AGO-228 M3), other length on request

STANDARDIZED COMPREHENSIVE SYSTEMS

AGT-212 series

Ordering code	Combination parts
44.212.401	AGS-212 M4 + AGO-100 M3 + AGD-212 M4
44.212.403	AGS-212 M4 + AGO-080 M3 + AGD-212 M4

AGT-525 series

Ordering code	Combination parts
44.525.401	AGS-525 M3 + AGO-100 M3 + AGD-525 M1
44.525.402	AGS-525 M3 + AGO-150 M3 + AGD-525 M1
44.525.403	AGS-525 M3 + AGO-030 M3 + AGD-525 M1
44.525.404	AGS-525 M3 + AGO-080 M3 + AGD-525 M1
44.530.402	AGS-525 M3 + AGO-100 M3 + AGD-525 M2

AGT-530 series - Rugged execution

Ordering code	Combination parts
44.530.403	AGS-525 M4 + AGO-228 M3 + AGD-530 M3
44.530.404	AGS-525 M4 + AGO-208 M3 + AGD-530 M3
44.530.405	AGS-525 M4 + AGO-222 M3 + AGD-530 M3
44.530.406	AGS-525 M4 + AGO-235 M3 + AGD-530 M3
44.530.407	AGS-525 M4 + AGO-216 M3 + AGD-530 M3

AGT-550 series

Ordering code	Combination parts
44.550.401	AGS-550 M3 + AGO-100 M3 + AGD-550 M1
44.550.402	AGS-550 M3 + AGO-100 M3 + AGD-550 M2
44.550.403	AGS-550 M3 + AGO-100 M3 + AGD-550 M3

AGT-550MX series

Ordering code	Combination parts
44.550.451	AGS-550 MX + AGO-100 M3 + AGD-550 MX

ACCESSORIES FOR AGT

Ordering code	Description
44.902.001	Flexible Polyamid PA-6 conduits 1.2m
44.902.002	Flexible Polyamid PA-6 conduits 1m
44.902.012	Flexible Polyamid PA-6 conduits 1.5m
44.902.004	Flexible Metallic Conduit SPR-AS 10.2m
44.902.005	Flexible Metallic Conduit SPR-AS 8.2m
44.902.006	Flexible Metallic Conduit SPR-AS 15.2m
44.902.007	Flexible Metallic Conduit SPR-AS 3.2m
44.906.002	AGS/MFS installation kit - Starter
44.906.003	AGS/MFS installation kit - Refill

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Quality certification



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